(No Model.)

A. ANGST.

LOCK FOR KNITTING MACHINES.

No. 265,359. Patented Oct. 3, 1882.

Fig. 5.

Fig. 1.

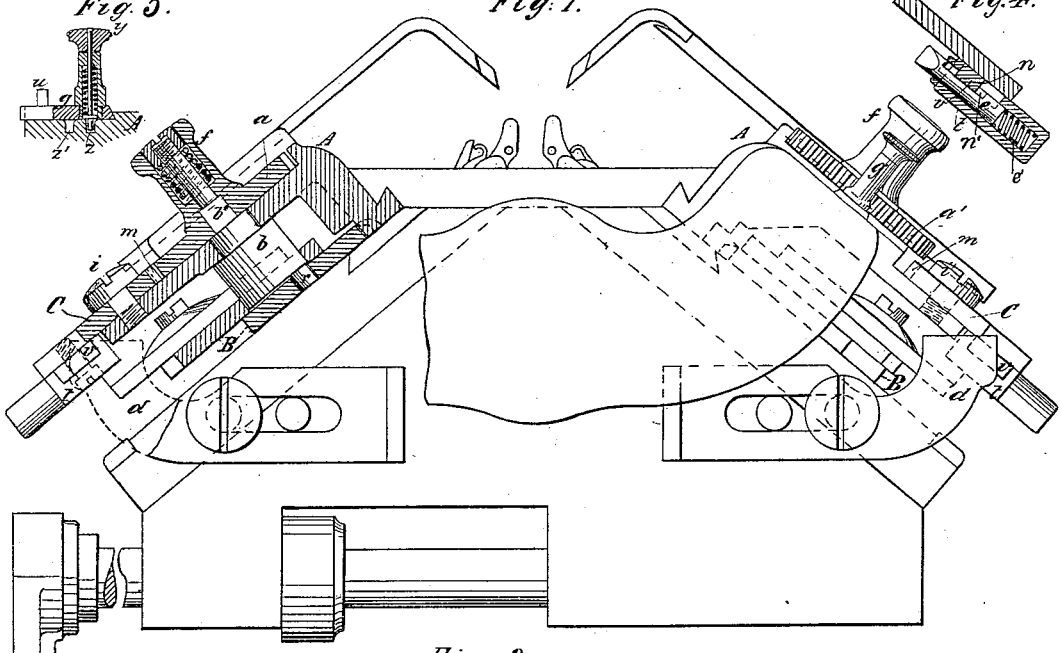


Fig. 4.

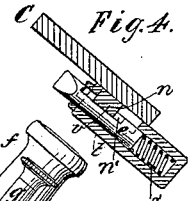


Fig. 2.

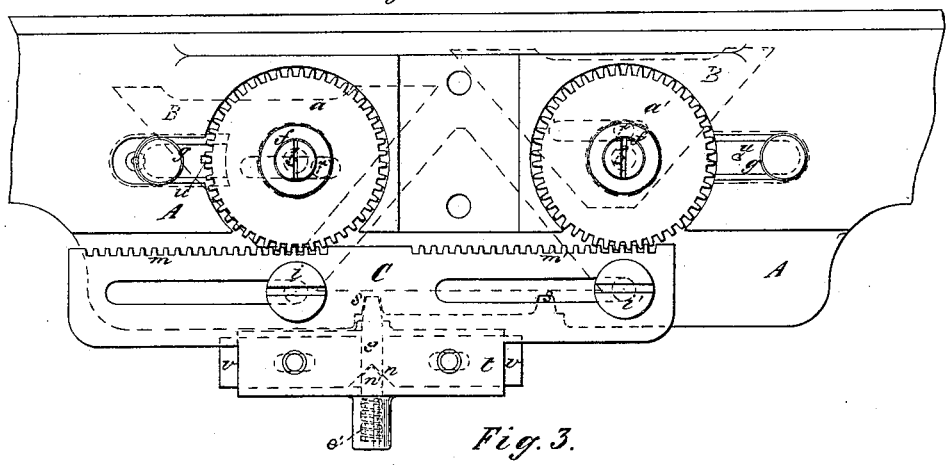
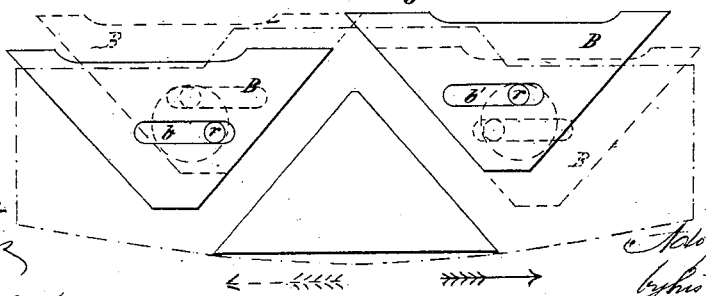


Fig. 3.



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ADOLF ANGST, OF SCHAFFHAUSEN, SWITZERLAND.

LOCK FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 265,359, dated October 3, 1882.

Application filed August 10, 1882. (No model.) Patented in Germany July 10, 1881, No. 17,834; in Belgium July 23, 1881, No. 55,256 and in France July 25, 1881, No. 144,088.

To all whom it may concern:

Be it known that I, ADOLF ANGST, of Schaffhausen, in the Republic of Switzerland, have invented a new and useful Improvement in Locks for Knitting-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention is applicable particularly to what is known as the "Lamb" knitting-machine, but may be applicable to other knitting-machines having locks of similar character.

The object of the invention is to provide for automatically lifting, at the end of each stroke of the carriage, that wing-cam which will be in advance during the return-stroke of the carriage, and so prevent the lower edge of that cam during such return-stroke from coming in contact with the feet of the needles. As in either stroke of the carriage the only one of the wing-cams which is required to operate the needles is that which follows the center cam, it is advantageous to lift the other wing-cam so high that it cannot possibly come in contact with the needle-feet.

In the accompanying drawings, Figure 1 is an end view, with the left-hand side partly in section, of a Lamb knitting-machine with my invention applied. Fig. 2 is a plan of the central portion of the carriage and of the cam-operating mechanism of the lock. Fig. 3 is a bottom view of the knitting-cams. Fig. 4 is a vertical section of the stop by which the wing-cams are secured while either is in its raised and the other in its operative position. Fig. 5 is a vertical section of one of the dogs by which my automatic cam-operating mechanism may be thrown out of gear when desired.

Similar letters of reference indicate corresponding parts in the several figures.

Instead of the commonly-used counter-disks of the locks, toothed disks *a a'* are placed in recesses formed in the upper sides of the carriage A, above or outside of the locks. These disks are connected with the bolts *b b'*, which have eccentrically set in them the pins *r r*, that enter into the slots of the wing-cams B B. By turning the disks *a a'* the corresponding bolts, *b b'*, are turned and the pins *r* shift the wing-cams in an upward or downward direction. The movements of the disks *a a'* are produced by a rack, C, guided by slots on bolts *i i'*, fastened to the lock-plate. This rack, furnished with teeth *m m'*, gearing with the teeth of disks *a a'*, is toward the end of each stroke of the carriage shifted on the guiding-bolts *i i'* by the means to be presently described. The rack C is stopped or prevented from accidental movement by a pin or stop, *e*, engaging with one of two notches *s s* (see Fig. 2) in the lower edge of the carriage. This pin or stop is unlocked at each stroke of the carriage by the sliding bar *v* pushing against one of two stationary arms *d*, fastened one to each end of the machine-frame, on each side of the machine, the said bar *v* sliding in a box, *t*, provided on the rack, and having in its upper edge a V-shaped cam-notch, *n*, which operates against a corresponding angular surface, *n'*, on the bottom of a notch in the said pin. A spring, *e'*, is applied to the said pin *e* within the box *t* to press it into either notch *s* to which it may be opposite.

It may be here remarked that the stops *d* may be those commonly in use for shifting the center cam.

With regard to the drawings, the movements of the wing-cams are as follows: As soon as the carriage has nearly completed its stroke toward the right, which is the condition represented in Fig. 1, the end of bar *v*, projecting at right-hand side, strikes the fixed arm *d* of the machine-frame, and is in consequence of the forward motion of the carriage shifted to the left-hand side. Pin *e* is unlocked from the notch *s* in the lock-plate or projection of the carriage, and, the rack C being stopped, operates as though it were pushed to the left and turns both disks *a* and *a'* in direction from left to right. The eccentric pin of bolt *b'* moves downward and draws the wing-cam of the right-hand side downward, while the eccentric-pin of bolt *b* rises and lifts the cam of the left-hand side. As soon as the motion of the carriage is reversed the wing-cam at the left-hand side (then advancing) is out of working position, and cannot hit the needle-feet or draw the loops tighter than this had been done before by the wing-cam that had been in action while these loops were formed. As soon as the carriage has nearly completed its stroke to the

left the bar *v* strikes the other arm *d*, attached to the other side of the frame, and the reverse play of the cams takes place, and the wing-cam of the right-hand side is lifted out of the reach of the needle-feet.

Fig. 3 shows the different positions of the cams of a lock during operation.

If desired for any work, each toothed disk *a a'* can be put out of action by taking hold of the knob *f*, with which it is provided, and lifting it upward and by pushing under it a slide, *g*, that slides in a slot or guide of the carriage.

The edges or marginal portions of the disks *a a'* may be graduated and numbered, and by lifting the disks out of gear with the rack C and off the squares *b**, provided on the bolts *b b'*, the relative position of the disks and corresponding pins can be altered for the purpose of changing or altering in various degrees the height to which the cams are lifted, the numbers on the disks serving to indicate the positions of the pins *r*.

The slides *g g* are each provided with a tooth, *u*, which, when the slide is pushed under its respective disk *a* or *a'*, will engage between the teeth of the disk, as shown at the right-hand end of Fig. 2, and so prevent the disk from turning. The slide is locked either in or out of gear with its disk by a little spring-bolt, *y*, (see Fig. 6,) which is capable of entering either one of two notches, *z z'*, in the carriage A, and which may be pulled out of these notches by taking hold of the knob at its upper end, the said knob also serving as a handle to shift the slide.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the carriage, the wing-cams, the bolts *b b'*, and the pins *r r*, set eccentrically therein, of the toothed disks *a a'*, the rack C, and the stops at the ends of the machine for arresting the racks while the movement of the carriage continues, substantially as herein described.

2. The combination, with the carriage or lock-plate provided with notches *s s*, of the rack C, the locking-pin *e*, and the sliding cam-bar *v* for operating on the said pin, substantially as described, and as illustrated in the accompanying sheet of drawings.

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